(No Model.)

J. H. DIXON.

TOOL ATTACHMENT.

No. 421,391. Patented Feb. 18, 1890.

Fig. 1

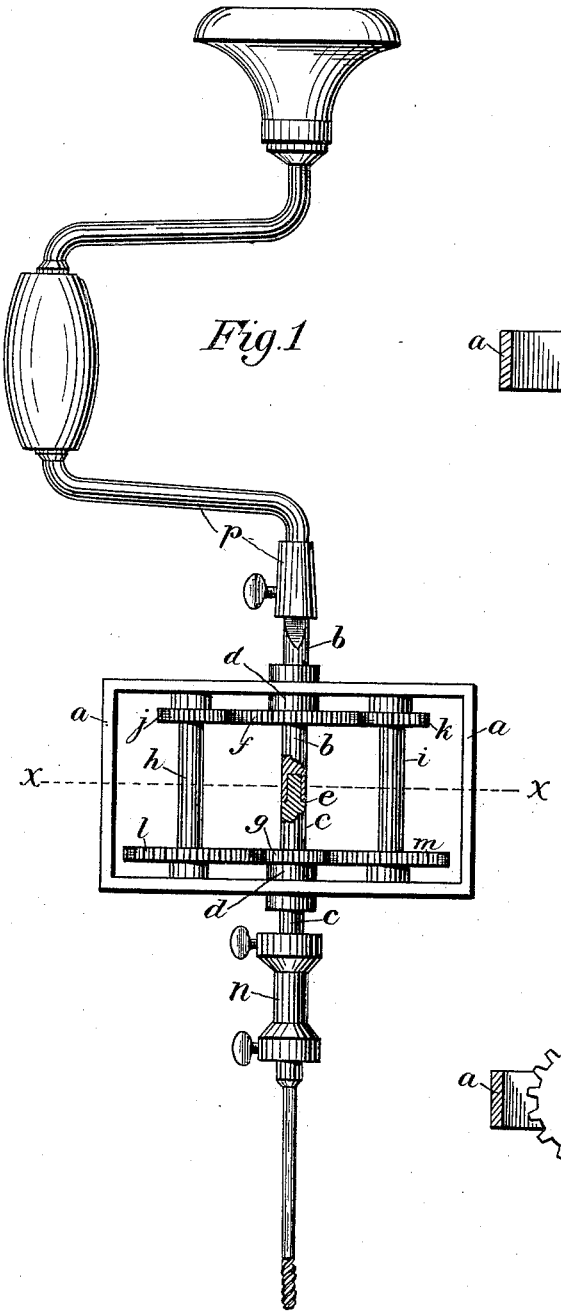


Fig. 2

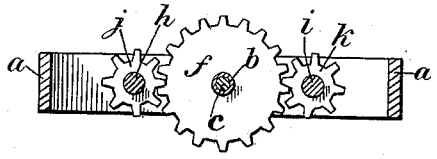
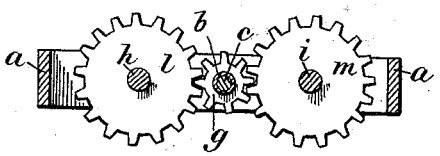


Fig. 3



WITNESSES.

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UNITED STATES PATENT OFFICE.

JOHN H. DIXON, OF PITTSBURG, PENNSYLVANIA.

TOOL ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 421,391, dated February 18, 1890.

Application filed March 21, 1888. Serial No. 267,982. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. DIXON, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Tool Attachments; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side view of my improvement in tools. Figs. 2 and 3 are sections on the line *x x* of Fig. 1.

Like letters of reference indicate like parts in each.

In the drawings, *a* represents a rectangular frame formed of brass or other suitable material. Extending transversely through this frame at the middle thereof is a shaft *b c*, which is journaled in bearings or sockets *d*, forming part of the frame. This shaft *b c* is formed in two parts, being divided at the point *e* about midway inside of the frame, the portion *b* of the shaft being countersunk, while the end *c* is provided with a projection which fits in the countersunk portion, so as to form a mutual bearing between the two portions of the shaft. Keyed to the portion *b* of the shaft within the frame *a* is a gear-wheel *f*, and keyed to the portion *c* of the shaft within the frame is a pinion *g*. On each side of the shaft *b c*, within the frame *a*, are shafts *h i*, on which are keyed the pinions *j k* and gear-wheels *l m*, the pinions *j k* gearing with the gear-wheel *f* and the gear-wheels *l m* gearing with the pinion *g*. The two ends of the shaft *b c* which extend beyond the frame *a* are squared, so as to receive and engage with a socket-piece *n*, which is provided with a socket at each end, one socket being to engage with the shaft and the opposite socket being for the purpose of receiving a bit. As each end of the shaft *b c* projects beyond the frame *a* and is squared to receive the socket-piece *n*, it also fits the mouth of the brace *p*, the mouth of which is provided with the usual set-screw for securing the shaft *b c* to the brace.

The operation is as follows: The brace being fitted on the projecting portion *b* of the shaft and secured thereto by the set-screw, the socket-piece *n* is fitted on the projecting portion *c* of the shaft, and the bit is fitted in the other end of the socket-piece. Upon turning the brace power is applied to the portion *b* of the shaft and by means of the gear-wheel *f* to the pinions *j k* and shafts *h i*, whereby the gear-wheels *l m* impart power to the pinion *g* and portion *c* of the power-shaft, whereby the bit is given a rapid revolution compared to the revolution of the brace. By reversing the socket-piece *n* to the portion *b* of the power-shaft and the brace to the portion *c* of the power-shaft the pinion *g* imparts power to the gear-wheels *l m* and shafts *h i*, and the pinions *j k* impart power to the gear-wheel *f* on the part *b* of the shaft, so that a slow but powerful movement is imparted to the bit by the movement of the brace.

The advantages of my improvement are, that by merely reversing the parts a powerful and slow movement may be imparted to the bit, or, where it is desired, a rapid motion may be applied to the same. Another advantage is that the vertical force applied to the bit is in a straight line on the shaft *b c*.

This attachment may be applied to boring and drilling tools and machines of any kind, whether they be used for working on wood or metal, and instead of using it with a brace, such as I have shown, any other suitable power-connection may be employed.

I claim—

1. A frame *a*, a power-shaft composed of the jointed and separable parts *b c*, the said parts *b* and *c* projecting through the frame on opposite sides and in alignment, and squared to receive power and tool appliances, a gear-wheel and a pinion on said shaft, two shafts *h* and *i*, arranged in bearings in said frame and on opposite sides of the power-shaft, and pinions and gear-wheels on said shafts *h* and *i*, respectively engaging with the gear-wheel and pinion on the power-shaft, the whole constituting a reversible differential motor attachment for tools, substantially as described.

2. The combination of a frame *a*, power-

shaft *b c*, having gear-wheel *f* and pinion *g*, the ends of the shaft being adapted to engage with a bit and brace-holder, gear-wheels *j k*, pinions *l m*, shafts *h i*, a socket-piece *n*, having sockets at opposite ends to receive a bit and to be applied to the power-shaft, and a brace and bit, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 13th day of March, A. D. 1888.

JOHN H. DIXON.

Witnesses:
W. B. CORWIN,
JNO. K. SMITH.